

*Research Article*

The Effect of Brine Solution on Mushroom (*Pleurotus Ostreatus*) Preserved at Room Temperature (26-300C)

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ARTICLE INFO	ABSTRACT
<p>Article No.: 030613518 DOI: 10.15580/GJAS.2013.6.030613518</p> <hr/> <p>Submitted: 06/03/2013 Accepted: 22/06/2013 Published: 29/06/2013</p> <hr/> <p>*Corresponding Author Wabali C. Victor E-mail: Victorwabali@yahoo.com Phone: 234-805-958-6312</p> <hr/> <p>Keywords: Mushroom, Preservation and Brine Solution</p>	<p>The Preservative effect of brined solution on mushroom at tropical room temperature of 26-30°C was examined. The effect of various concentrations of brine solutions on color, texture, and smell as well as shelf duration were examined. The experiment was laid out in a Complete Randomized Design (CRD) and each treatment replicated 4 times including control. Sensory qualities of blanched and packed mushroom were examined by panelists using a hedonic scale ranking, differences were analyzed using Analysis of Variance (ANOVA). Result indicates that at brine concentration of 35% quality parameter of color, texture and smell remained intact for duration of six (6) days.</p>

INTRODUCTION

Mushroom is highly perishable and most of the mushrooms cultivated in Sub-Sahara Africa are lost due to moisture loss, wilting, color changes and poor preservative methods. Improving the shelf life and quality characteristics of mushroom will enhance marketability and add value in agricultural chain. The market for mushroom continues to grow due to interest in their culinary, nutritional and health benefits (Beetz and Kustia, 2004). Evolving preservation methods that are cheap and affordable by farmers has become imperative in order to have food sustainability. The patterns of food consumption in Nigeria especially in the rural areas represent a sharp deviation from synthetic sweetened foods to the fresh and natural meals. Mushrooms represent a valuable food source which cannot be over looked (Ola – Adams 1995).

Hence this study is aimed at preventing wastage arising from spoilage by determining the best concentration of brine solution that will be effective in the preservation of mushroom under Sub-Sahara tropical condition. Mushrooms are grown both in the wild and in the farm (Chilton 1993). There are various species of mushrooms; while some are edible others are harmful. There are about 200 common poisonous mushroom varieties, however the vast majority of mushrooms are harmless and edible mushrooms are available in the market (Alan 2002).

Microbial growth and activity has been inhibited or suppressed by the use of brine solution. Salt solution reduces the spoilage of foods but produces a salty product. Salt reduces the water availability in the food (Bahl 1987). The objective of blanching is to inactivate the enzymes causing detrimental changes in color, odour, flavor, and nutritive value. (Gutschnuds 1968). The loss of water soluble vitamins and minerals should be minimized by keeping blanching time and temperature at an optimum condition (Spiess 1984).

Blanching is usually carried out between 75°C and 95°C for one to ten minutes depending on the size

of the individual vegetable pieces (Holdsworth 1983). For water blanching, vegetable is put in a basket and then placed in a kettle of boiling water covered with a lid. Timing begins immediately (Archuleta 2003). Packaging is carried out to protect foods from physical damage, chemical attack and contamination from biological vectors including micro-organisms, insects and rodents (Potter and Hotchkiss, 2007).

MATERIAL and METHODS:

Transparent Plastic container
Table salt (NaCl)
Water
Mettler balance
Electric heater
Measuring jar
Mushroom

Freshly harvested mushroom was washed with water that has been boiled and allowed to cool. This is to prevent contamination from washing water. The mushroom is then drained and blanched with hot water of about 70-75°C for one minute in order to inactivate enzymes, reduce contamination and remove tissue gas. The blanched *Pleurotus Ostreates* (Mushroom) is then immersed in brine solution of different concentration 5%, 10%, 15%, 20%, 25%, 30%, 35% and control. Each concentration is replicated 4 times as well as the control.

A plastic PVC container which has been washed with detergent solution and rinsed with clean water is used to store the mushroom. The samples are kept at tropical room temperature of 26-30°C and changes in color, texture and smell monitored on a daily basis by selected panelists through sensory evaluation of quality parameters of color, texture and smell as well as shelf life. A hedonic scale ranking was used and differences analyzed using analysis of variance.

RESULT AND DISCUSSION

Table 1: Effect of Preservation Room temperature on Colour, Smell and Texture of Mushroom

Treatment	Colour	Smell	Texture	Duration (days)
control	4.05	2.50	2.30	3
5conc.	3.90	2.40	2.27	3
10conc.	3.85	2.27	2.16	3
15conc.	3.80	2.17	2.05	3
20conc.	2.06	1.48	1.59	4
25conc.	1.20	1.05	1.07	6
30conc.	1.00	1.00	1.00	7
35conc.	1.00	1.00	1.00	7

Ranking of Colour, Smell and Texture.

Colour: 1 - 9

Smell: 1 - 5

Texture: 1 - 5

1 – Fresh
5 - Bad
9 - Very Bad

1 – fresh
5 – bad

1 - strong
5 - soft

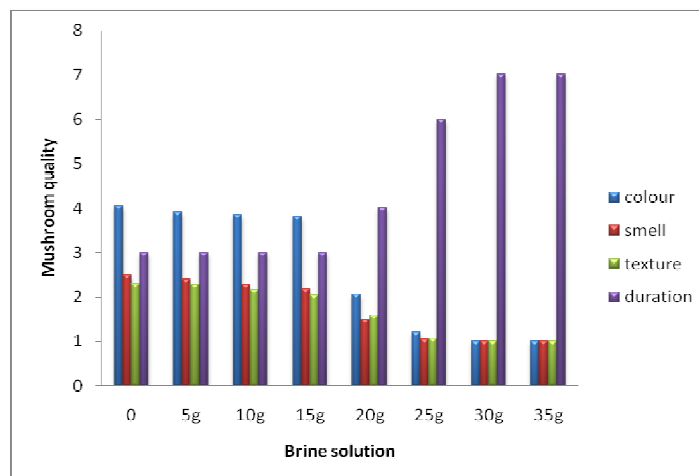


Fig.1: Effect of brine solution on preservation of mushroom at room temperature

Results obtained indicate the preservative effect of brine solutions at concentration above 15% on mushroom quality parameters of colour, texture, smell and shelf life. At 0-15%, concentration the changes in color, texture and smell were not significant while the shelf stability remained the same as the control. However, 20% concentration of brine solution showed a significant change in quality parameter. There is a direct relationship between mushroom qualities of color, texture, smell and shelf life above 20% threshold concentration. As the concentration of brine solution increases the quality parameters of mushroom improves both in colour, texture smell and shelf life. Although, there is no change in quality characteristic after 35% concentration.

Results also show that the shelf life of mushroom stored in brine solution at tropical room temperature of 26-30°C can be doubled. There is a 100% improvement in shelf life of mushroom when treated with 30% brine solution when compared with the control that had a shelf life of 3 days.

CONCLUSION

Brine solution has a preservative effect on mushroom quality characteristics of colour, texture at a temperature range of 25-30°C. Best results were obtained at a concentration of 30% brine solution. Colour, texture, and smell remained intact for a 7 day period.

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